



Climatic variables and malaria transmission dynamics in Jimma town, South West Ethiopia

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Year: 2011
Journal: Parasites & Vectors. 4: 30

Abstract:

BACKGROUND: In Ethiopia, malaria is seasonal and unstable, causing frequent epidemics. It usually occurs at altitudes < 2,000 m above sea level. Occasionally, transmission of malaria occurs in areas previously free of malaria, including areas > 2,000 m above sea level. For transmission of malaria parasite, climatic factors are important determinants as well as non-climatic factors that can negate climatic influences. Indeed, there is a scarcity of information on the correlation between climatic variability and malaria transmission risk in Ethiopia in general and in the study area in particular. Therefore, the aim of this study was to determine the level of correlation between meteorological variables and malaria cases.

METHODS: Time-series analysis was conducted using data on monthly meteorological variables and monthly total malaria in Jimma town, south west Ethiopia, for the period 2000-2009. All the data were entered and analyzed using SPSS-15 database program. Spearman correlation and linear regression analysis were used to assess association between the variables.

RESULTS: During last ten years (2000-2009), a fluctuating trend of malaria transmission was observed with *P.vivax* becoming predominant species. Spearman correlation analysis showed that monthly minimum temperature, total rainfall and two measures of relative humidity were positively related with malaria but monthly maximum temperature negatively related. Also regression analysis suggested that monthly minimum (p Euro Surveillance (Bulletin European Sur Les Maladies Transmissibles; European Communicable Disease Bulletin) 0.008), monthly maximum temperature (p Euro Surveillance (Bulletin European Sur Les Maladies Transmissibles; European Communicable Disease Bulletin) 0.013) and monthly total rainfall (p Euro Surveillance (Bulletin European Sur Les Maladies Transmissibles; European Communicable Disease Bulletin) 0.040), at one month lagged effect, were significant meteorological factors for transmission of malaria in the study area.

CONCLUSION: Malaria incidences in the last decade seem to have a significant association with meteorological variables. In future, prospective and multidisciplinary cooperative research involving researchers from the fields of parasitology, epidemiology, botany, agriculture and climatology is necessary to identify the real effect of meteorological factors on vector-borne diseases like malaria.

Source: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3055844>

Resource Description

Exposure : ☐

weather or climate related pathway by which climate change affects health

Meteorological Factors, Precipitation, Temperature

Climate Change and Human Health Literature Portal

Temperature: Fluctuations

Geographic Feature: ☒

resource focuses on specific type of geography

None or Unspecified

Geographic Location: ☒

resource focuses on specific location

Non-United States

Non-United States: Africa

African Region/Country: African Country

Other African Country: Ethiopia

Health Impact: ☒

specification of health effect or disease related to climate change exposure

Infectious Disease

Infectious Disease: Vectorborne Disease

Vectorborne Disease: Mosquito-borne Disease

Mosquito-borne Disease: Malaria

Resource Type: ☒

format or standard characteristic of resource

Research Article

Timescale: ☒

time period studied

Time Scale Unspecified